

What is Claimed is:

1. An apparatus for compensating for optical loss, said apparatus comprising:
a plurality of optical fibers joined to define a plurality of output ports and a fiber junction;
and
a signal amplification device positioned between the fiber junction and each of the plurality of output ports to communicate with said plurality of optical fibers.
2. The apparatus of claim 1 wherein said signal amplification device comprises a semiconductor optical amplifier.
3. The apparatus of claim 1 wherein said signal amplification device comprises a plurality of semiconductor optical amplifiers.
4. The apparatus of claim 1 further comprising an active fiber region including a dopant residing within said optical fibers between the fiber junction and each output port, and wherein said signal amplification device comprises at least one light source coupled to the active fiber region to emit light into the active fiber region at a wavelength and power sufficient to excite the dopant.
5. An apparatus for compensating for optical loss, said apparatus comprising:
a plurality of optical fibers joined to form an input port, a coupled region, a fiber junction, and a plurality of output ports; and
a signal amplification device positioned between the fiber junction and each of the plurality of output ports to communicate with said plurality of optical fibers such that an optical signal passing between the fiber junction and each of the output ports is amplified.
6. The apparatus of claim 5 wherein said signal amplification device comprises a semiconductor optical amplifier.

7. The apparatus of claim 5 wherein said signal amplification device comprises a plurality of semiconductor optical amplifiers.

8. The apparatus of claim 5 further comprising an active fiber region including a dopant residing within said optical fibers between the fiber junction and each output port, and wherein said signal amplification device comprises at least one light source coupled to the active fiber region to emit light into the active fiber region at a wavelength and power sufficient to excite the dopant.

9. The apparatus of claim 8 wherein one of said active fiber regions comprises erbium and wherein the other of said active fiber regions comprises a dopant other than erbium.

10. The apparatus of claim 8 wherein said at least one light source comprises a plurality of LEDs.

11. A method of compensating for optical loss, said method comprising the steps of:
receiving an optical signal through an input port of an optical splitter, said optical splitter comprising a fiber junction, a first output port, and a second output port;

dividing the optical signal at the fiber junction such that a first portion of the optical signal is directed toward the first output port and a second signal portion is directed toward the second output port; and

amplifying the first and second signal portions of the optical signal with a signal amplification device positioned between the fiber junction and each output port while the signal portions are traveling between the fiber junction and the output ports.

12. The method of claim 11 wherein said signal amplification device comprises a semiconductor optical amplifier and wherein said amplifying step includes the step of boosting the first and second signal portions via stimulated emission.

13. The method of claim 11 wherein said signal amplification device comprises a LED and wherein said optical splitter further comprises a dopant containing active fiber region between

the fiber junction and each output port, said amplifying step comprising the step of emitting light from said LED into the active fiber region at a wavelength and power sufficient to excite the dopant as the first and second signal portions are passed through the active fiber regions.

14. A process of manufacturing an optical signal loss compensating device, said process comprising the steps of:

joining at least two optical fibers to form a coupled region, a fiber junction, and a plurality of output ports; and

positioning a signal amplification device between each output port and the fiber junction.

15. The process of claim 14 further comprising the step of radially splicing said at least two optical fibers between said fiber junction and said plurality of output ports prior to said positioning step.

16. The process of claim 15 wherein said signal amplification device comprises a semiconductor optical amplifier and wherein said positioning step comprises placing the semiconductor optical amplifier between the spliced ends of said at least two optical fibers.

17. A device made by the process of claim 14.

18. The process of claim 14 wherein said at least two optical fibers each comprise an active fiber region, and wherein said signal amplification device comprises a LED, said positioning step comprising the step of mounting the LED adjacent the active fiber region.

19. The process of claim 18 wherein said LED comprises a plurality of LEDs, said positioning step comprising the step of mounting said plurality of LEDs adjacent the active fiber region.

20. A loss compensating optical communication system comprising:
a transmitter;
a receiver;

